

CLAIMS

We claim:

1. Wash resistant durable fabrics comprising 50 to 95% flame resistant cotton, 5 to 30% non-flame-retardant thermoplastic fibers, 0 to 30% thermoset fibers wherein the cotton fibers are uniformly treated with a durable flame retardant of a prepolymer condensate of urea and a tetrakis-(hydroxymethyl) phosphonium salt which has been applied, ammoniated and oxidized in a manner such that after exposure to 5 washes and 24 hours emersion in boiling water the fabrics burn less than 15 mm (6") at cut edges and retain at least 2.0% and no more than 3.0% phosphorus by weight of fabric.
2. The product of claim 1 in which the thermoplastic fiber is in the warp only.
3. The product of claim 1 in which the thermoplastic fibers are nylon.
4. The product of claim 1 in which the thermoplastic fibers are polyester.
5. The product of claim 1 in which the thermoset fibers are poly(p-phenylene terephthalamide).

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6. A method for making wash resistant durable fabrics of the fiber composition of claims 1-5 in a single application and cure process by impregnating the fabrics with an aqueous solution containing a prepolymer condensate of urea and a tetrakis (hydroxymethyl) phosphonium salt, The salt/urea prepolymer condensate is applied to the fabric in a concentration sufficient to apply between 3.0 and 4% phosphorus at 60 to 80% wet pickup, padded to between 60 and 80% wet pickup and dried to between 8 and 12% moisture. It is then reacted on the fabric with ammonia gas, flowing at 2.5 to 3.4 cu m/min (90 to 120 cu ft/min) to form an ammoniated flame retardant which is in turn oxidized to form a flame retardant polymer within the cotton fibers. Flame retardant concentration, wet pickup and moisture level of the fabric going into the ammoniator are adjusted within their respective ranges described above such that after 5 washes and 24 hours in boiling water, the fabric retains at least 2 and no more than 3% phosphorus and burns less than 15mm (6") at cut edges.

7. The process of claim 6 in which the tetrakis-(hydroxymethyl) phosphonium salt is the sulfate salt.

8. The process of claim 6 in which the tetrakis-(hydroxymethyl) phosphonium salt is the chloride salt.

9. The process of claim 6 in which the tetrakis-(hydroxymethyl) phosphonium salt is the phosphate salt.

10. The process of claim 6 in which the tetrakis-(hydroxymethyl) phosphonium salt is the oxalate salt.

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